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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/967,299	09/28/2001	Enio L. Carpi	01 P 14622 US (8055-112)	4736

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Jackson Walker LLP
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EXAMINER

STOCK JR, GORDON J

ART UNIT PAPER NUMBER

2877

DATE MAILED: 11/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No. 09/967,299	Applicant(s) CARPI ET AL.
Examiner Gordon J Stock	Art Unit 2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11, 14, 15 and 18-20 is/are rejected.
- 7) ☒ Claim(s) 12, 13, 16, 17, 21 and 22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 March 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
 a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. Figures 1a and 1b should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. The specification is objected to for the following: the phrase, 0_π phase conflict, is unclear for the disclosure lines 15-20 of page 6 defines this as “destructive interference between light passing through the 0 degree phase region with the light passing through the 180 degree region,” and, the phrase, 0_π phase conflict, as interpreted by the Examiner reads 0 to π phase conflict. Clarification/correction of the phrase (throughout the disclosure) is required. Examiner suggests the phrase read –0 degree phase and π phase conflict—or –conflict between 0 degree and π phase regions—or possibly, interference between 0 degree and π phase regions. No new matter should be added.

Claim Objections

3. Though the Examiner suggested for claim 11 to have the phrase, “0_π phase conflict” read –0 to π phase conflict–, the term is unclear, for the specification page 6 lines 15-20 defines this conflict as “destructive interference between light passing through the 0 degree phase region with the light passing through the 180 degree region,” and, the phrase, 0_π phase conflict, as interpreted by the Examiner reads 0 to π phase conflict. Clarification of the phrase is required.

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Examiner suggests the phrase read –0 degree phase and pi phase conflict—or –conflict between 0 degree and pi phase regions—or possibly, interference between 0 degree and pi phase regions. Examiner apologizes for the inconvenience.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claims 11 and 14** are rejected under 35 U.S.C. 102(b) as being anticipated by **Muraki (5,182,455)**.

As for **claims 11 and 14**, Muraki in a method of detecting deviation between two objects discloses the following: an illumination tool for irradiating the mask so as to create a bright spot by a 0 and pi phase conflict during illumination; a detection tool for detecting the bright spot and an alignment mark on the wafer; and alignment means for aligning the mark with the spot (Figs. 1, 6, 8; col. 6, lines 15-67; col. 7, lines 20-67; col. 11, lines 20-55; col. 12, lines 5-35). The mark comprises box structures (Fig. 5).

6. **Claim 20** is rejected under 35 U.S.C. 102(b) as being anticipated by **Magome et al. (5,734,478)**.

As for **claim 20**, Magome in a projection exposure apparatus discloses an illumination tool for irradiating the mask to create a spot; a detection tool for detecting the spot and the alignment mark, whereas, the spot is baseline and the marks are intensity peaks; alignment

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means for aligning the mark with the spot so as to align the wafer and the mask (Fig. 2; Fig. 6; col. 10, lines 25-67; col. 11, lines 1-35; col. 15, lines 40-65).

7. **Claim 20** is rejected under 35 U.S.C. 102(b) as being anticipated by **Nakazawa et al. (4,266,876)**.

As for **claim 20**, Nakazawa et al. in an alignment apparatus discloses an illumination tool for irradiating the mask to create a spot; a detection tool for detecting the spot and the alignment mark; whereas, the spot is baseline and the marks are intensity peaks; alignment means for aligning the mark with spot (Figs. 1-3; col. 3, lines 45-65; col. 5, lines 30-65; col. 6, lines 5-30).

Claim Rejections - 35 USC § 103

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

9. **Claim 15** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Muraki (5,182,455)** in view of Adams (**5,968,693**).

As for **claim 15**, see **claim 14** above. Muraki is silent concerning film stack variation. However, Adams in a lithography tool adjustment method teaches that film stack topography causes effects in measurements. Therefore, it would be obvious to one skilled in the art to have the box structure created to minimize film stack variations, for film stacks causes effects in measurements.

10. **Claim 18** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Muraki (5,182,455)** in view of **Feldman et al. (4,037,969)**.

As for **claim 18**, see **claim 11** above. However, Muraki is silent concerning the illumination tool generating the alignment mark. Feldman in an alignment system teaches that it

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is well known in the art to have the illumination tool produce the alignment mark (col. 4, lines 10-20). Therefore, it would be obvious to one skilled in the art at the time the invention was made to have the illumination tool generate the alignment mark, for alignment marks are produced by illumination tools.

11. **Claim 19** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Muraki (5,182,455)** in view of **Feldman et al. (4,037,969)** and further in view of **Adams (5,968,693)**.

As for **claim 19**, see **claim 18** above. Muraki is silent concerning film stack variation. However, Adams in a lithography tool adjustment method teaches that film stack topography causes effects in measurements. Therefore, it would be obvious to one skilled in the art to have the box structure created to minimize film stack variations, for film stacks causes effects in measurements.

Allowable Subject Matter

12. **Claims 12, 13, 16, 17, 21, and 22** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As to **claim 12**, the prior art of record, taken alone or in combination, fails to disclose or render obvious in a system for aligning a semiconductor wafer and a mask the alignment mark on the semiconductor wafer is in a form of a frame, in combination with the rest of the limitations of **claims 12-13**.

As to **claim 16**, the prior art of record, taken alone or in combination, fails to disclose or render obvious fails to disclose or render obvious in a system for aligning a semiconductor wafer

and a mask “wherein the illumination tool generates the alignment mark in a form of a frame,” in combination with the rest of the limitations of **claims 16-17**.

As to **claim 22**, the prior art of record, taken alone or in combination, fails to disclose or render obvious in a system for aligning a mask and a semiconductor wafer having thereon an alignment mark “wherein the alignment mark is in a form of a frame,” in combination with the rest of the limitations of **claims 22-23**.

Response to Arguments

13. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Fax/Telephone Numbers

If the applicant wishes to send a fax dealing with either a proposed amendment or a discussion with a phone interview, then the fax should:

- 1) Contain either a statement “DRAFT” or “PROPOSED AMENDMENT” on the fax cover sheet; and
- 2) Should be unsigned by the attorney or agent.

This will ensure that it will not be entered into the case and will be forwarded to the examiner as quickly as possible.

Papers related to the application may be submitted to Group 2800 by Fax transmission. Papers should be faxed to Group 2800 via the PTO Fax machine located in Crystal Plaza 4. The form of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CP4 Fax Machine number is: (703) 872-9306

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gordon J. Stock whose telephone number is (703) 305-4787.

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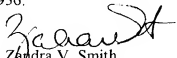
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The examiner can normally be reached on Monday-Friday, 10:00 a.m. - 6:30 p.m.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

gs

November 17, 2003


Zandra V. Smith
Primary Examiner
Art Unit 2877